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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/696,492

10/28/2003

Samantha S.H. Tan

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05/16/2007

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EXAMINER

KORNAKOV, MIKHAIL

ART UNIT

PAPER NUMBER

1746

MAIL DATE

DELIVERY MODE

05/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/696,492

Applicant(s)

TAN ET AL.

Examiner

Michael Kornakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 73-81 and 118-146 is/are pending in the application.
- 4a) Of the above claim(s) 73-81 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 118-146 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicants' amendment dated 03/01/2007 is acknowledged. Claims 1-72, 82-117 are cancelled. Claims 118-146 are new. Claims 73-81 have been previously withdrawn. Claims 118-146 are examined on the merits.
2. Applicants are reminded that the continuity data of the instant application needs to be updated.
3. Applicants' attention is drawn to US2004/0000237, listed in IDS dated 03/07/2007. The indicated reference is related to electric coffee maker, which apparently is not relevant to the instant application.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 118, 119, 122-141, 144-146 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM (IBM Technical Disclosure Bulletin, vol.3, no.5) in view of JP11-290805 and in further view of Spring (Metal Cleaning, Reinhold Publishing Corporation, 1963, pages 83-89).

IBM teaches cleaning molybdenum masks with a single aqueous solution including HCl, wherein the concentration of HCl in the cleaning solution corresponds to the claimed range. After cleaning the mask is flushed with the stream of water. The teaching of IBM does not specifically indicate presence a series of metals deposited on the molybdenum mask, as recited in the preamble of claim 118. However, it is noted

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here that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone, consult In re Hirao, 535 F.2d 67, 190 USPQ 15 (CCPA 1976). Therefore, one skilled in the art would have found obvious to clean molybdenum mask having deposits thereon, including a series of metal deposits, utilizing the method of IBM with the reasonable expectation of success.

While teaching placing a molybdenum mask in a hydrochloric acid cleaning solution, IBM remains silent about agitating the cleaning solution. However, agitating the cleaning solution in order to enhance cleaning of metal mask is known in the art. Thus, JP'805 teaches ultrasonic agitating during the cleaning of metal mask (0007, 0008). Therefore, one skilled in the art motivated by JP'805 would have found obvious to ultrasonically agitate the cleaning solution in order to enhance cleaning of molybdenum mask in the teaching of IBM.

The teaching of IBM/JP'805 do not specifically indicate the structural elements of the processing equipment and the steps of handling molybdenum (metal) mask during cleaning. Spring teaches conventional approach to handling metal parts during their cleaning, wherein metal parts are placed into a basket (reads on "container", as claimed) and the basket with metal part is placed into the processing solution, which is contained into the tank, wherein the tank includes a first vessel with processing solution, and wherein the first vessel is surrounded by liquid of the second vessel having transducers. Spring specifically indicates that the liquid is placed into the vessel

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(second) in contact with transducers and that the power should not be applied to the transducers unless tank has liquid in it (Spring, pages 88-89).

Because both IBM/JP'805 and Spring are concerned with ultrasonic cleaning of metal parts in aggressive solutions and Spring teaches the conventional approach to such cleaning, one skilled in the art motivated by teaching of Spring would have found obvious to follow the handling steps of Spring, namely to put molybdenum mask in a basket (container) and place the container into a cleaning solution, which is contained in a first vessel and provide a second vessel with transducers immersed in an aqueous solution surrounding the first vessel, as per teaching of Spring in order to create the optimum environment for propagating the ultrasonic waves into the cleaning solution and maintain safe environment while cleaning the mask with cleaning solution including HCl in the teaching of IBM/JP'805.

Regarding claim 119 reciting covering the first vessel with a lid, one skilled in the art would have found obvious to do so in order to prevent spreading the vapors of hazardous acidic cleaning solution into the surrounding areas and provide safe working environment while cleaning the mask as per method of IBM/JP'805/Spring.

With regard to processing parameters of claims 122-124, reciting concentration ranges for HCl, it is noted that the criticality of using such ranges is not shown on this record and that the concentration of HCl containing solution is result effective in cleaning process. Therefore, it would be obvious to optimize the concentration of HCl in the cleaning solution in order to efficiently clean the molybdenum mask in the teaching of IBM/JP'805/Spring.

With regard to claims 125-128, 141 it is also would be obvious to optimize cleaning time in order to efficiently clean the molybdenum mask in the teaching of IBM/JP'805/Spring.

Regarding claims 129-140, the teaching of IBM/JP'805/Spring does not specifically indicate that the agitation level is quantified in terms of agitation frequency or agitation power and does not specify the values of agitation frequency or agitation power. It is noted here that the agitation frequency or the agitation power represent conventional parameters of agitating process. It is also noticed here that these parameters are result effective, because they affect the physical conditions of cleaning liquid and therefore the effectiveness of cleaning process. However, discovery of optimum values of result effective variables in known process is ordinarily within the skill in the art and would have been obvious.

Regarding claims 144, 145, 146, Spring teaches the use of containers, made of plastics and the other materials, resistive to corrosive environment of cleaning liquids. Therefore, one skilled in the art, motivated by Spring would have found obvious to utilize known acid corrosion resistive materials, such as Teflon or high density polyethylene for chemical containers, in the combined teaching of IBM/JP'805/Spring.

6. Claim 120, 121 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM/JP'805/Spring and in view of Sachdev et al (U.S.2003/0066540).

While teaching cleaning molybdenum mask with HCl containing solution, followed by flushing molybdenum mask with water, the teaching of IBM/JP'805/Spring

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remains silent about drying the mask with nitrogen. However, drying with nitrogen is conventionally utilized in the art for treating hard masks. Thus, Sachdev teaches cleaning the mask followed by drying with nitrogen as the final step in preparation the mask for subsequent use (0058). Therefore, one skilled in the art motivated by Sachdev would have found obvious to dry the mask with nitrogen upon cleaning in order to store the mask and prepare it for subsequent use the teaching of IBM/JP'805/Spring.

7. Claims 118, 142, 143 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berasi et al (U.S. 5,744,214) in view of JP11-290805 and in further view of Spring (Metal Cleaning, Reinhold Publishing Corporation, 1963. pages 83-89).

Berasi discloses conventional method of cleaning molybdenum masks, having metals, such as chromium, copper, gold, lead and tin deposited thereon, by placing the mask into a strong acid solution, such as HCl solution to strip the process-deposited layers of chromium, copper, gold, lead and tin (col. 1, lines 30-33). Berasi also indicates that a conventional molybdenum mask has a set of through holes (Fig. 1; col. 2, lines 32-35). With regard to the specific concentration range of HCl solution, it is note here that the criticality of using such range is not shown on this record and that the concentration of HCl containing solution is result effective in cleaning process. Therefore, it would be obvious to optimize the concentration of HCl in the cleaning solution in order to efficiently clean the molybdenum mask in the teaching of Berasi.

While teaching placing a molybdenum mask in a strong hydrochloric acid cleaning solution, Berasi remains silent about agitating the cleaning solution. However,

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agitating the cleaning solution in order to enhance cleaning of metal mask is known in the art. Thus, JP'805 teaches ultrasonic agitating during the cleaning of metal mask (0007, 0008). Therefore, one skilled in the art motivated by JP'805 would have found obvious to ultrasonically agitate the cleaning solution in order to enhance cleaning of molybdenum mask in the teaching of Berasi.

The teaching of Berasi/JP'805 do not specifically indicate the structural elements of the processing equipment and the steps of handling molybdenum (metal) mask during cleaning. Spring teaches conventional approach to handling metal parts during their cleaning, wherein metal parts are placed into a basket (reads on "container", as claimed) and the basket with metal part is placed into the processing solution, which is contained into the tank, wherein the tank includes a first vessel with processing solution, and wherein the first vessel is surrounded by liquid of the second vessel having transducers. Spring specifically indicates that the liquid is placed into the vessel (second) in contact with transducers and that the power should not be applied to the transducers unless tank has liquid in it (Spring, pages 88-89).

Because both Berasi/JP'805 and Spring are concerned with ultrasonic cleaning of metal parts in aggressive solutions and Spring teaches the conventional approach to such cleaning, one skilled in the art motivated by teaching of Spring would have found obvious to follow the handling steps of Spring, namely to put molybdenum mask in a basket (container) and place the container into a cleaning solution, which is contained in a first vessel and provide a second vessel with transducers immersed in an aqueous solution surrounding the first vessel, as per teaching of Spring in order to create the

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optimum environment for propagating the ultrasonic waves into the cleaning solution and maintain safe environment while cleaning the mask with HCl cleaning solution in the teaching of Berasi/JP'805.

Response to Arguments

8. Applicant's arguments filed 03/01/2007 have been fully considered but they are not persuasive. Applicants argue that as seen from the illustration of Figure 28a shown on page 89 of Spring, objects to be cleaned are contained within a mesh basket, which is then immersed directly into the ultrasonic tank. This shows that Spring teaches only two levels of enclosure: a first vessel for containing the objects to be cleaned, and a second level (the tank) for applying ultrasonic energy to the objects.

This is not found persuasive since the tank of Spring includes an inner vessel with cleaning solution, which reads on a first vessel as claimed, and an outer vessel, which surrounds the inner vessel (reads on "the second vessel", as claimed), the outer vessel containing liquid wherein transducers are submerged for proper operation. Therefore, all levels of enclosure as instantly presented, are met by Spring.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael Kornakov
Primary Examiner
Art Unit 1746

05/12/2007